

Claims

1. An integrated manifold assembly for routing electrical signals in an internal combustion engine, the assembly comprising:
 - an air-intake manifold for drawing fresh air into the internal combustion engine;
 - a main circuit portion fixable to the air-intake manifold of the internal combustion engine;
 - a plurality of circuit runner portions extending from the main circuit portion for interconnecting the main circuit portion with a plurality of engine components; and
 - a heat sink affixed to the air-intake manifold and in contact with at least one of the a main circuit portion and the plurality of circuit runner portions for dissipating heat generated in the circuit portions.
2. The assembly of claim 1 wherein the air-intake manifold is substantially comprised of plastic.
3. The assembly of claim 1 wherein the heat sink is comprised of a thermally conductive material.
4. The assembly of claim 1 wherein the main circuit portion further comprises a flexible substrate for supporting electrical conductors and electrical devices.
5. The assembly of claim 1 wherein the main circuit portion further comprises a flexible substrate and a rigid substrate for supporting electrical conductors and electrical devices.
6. The assembly of claim 1 wherein the main circuit portion is in contact with the heat sink affixed to the air-intake manifold.
7. The assembly of claim 1 wherein the plurality of circuit runner portions are in contact with the heat sink affixed to the air-intake manifold.

8. The assembly of claim 1 wherein the main circuit portion and the plurality of circuit runner portions are in contact with the heat sink affixed to the air-intake manifold.

9. The assembly of claim 1 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices are mounted on the main circuit portion and the plurality of electrical conductors are affixed to the main circuit portion and the plurality of circuit runner portions.

10. The assembly of claim 1 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices and the plurality of electrical conductors are mounted throughout the main circuit portion and the plurality of circuit runner portions.

11. An integrated manifold assembly for routing electrical signals in an internal combustion engine, the assembly comprising:

an air-intake manifold for drawing fresh air into the internal combustion engine;

a main circuit portion fixable to the air-intake manifold of the internal combustion engine;

a plurality of circuit runner portions extending from the main circuit portion for interconnecting the main circuit portion with a plurality of engine components; and

a heat sink affixed to the air-intake manifold and is in contact with the main circuit portion for dissipating heat generated in the main circuit portion.

12. The assembly of claim 11 wherein the air-intake manifold is substantially comprised of plastic.

13. The assembly of claim 11 wherein the heat sink is comprised of a thermally conductive material.

14. The assembly of claim 11 wherein the main circuit portion further comprises a flexible substrate for supporting electrical conductors and electrical devices.

15. The assembly of claim 11 wherein the main circuit portion further comprises a flexible substrate and a rigid substrate for supporting electrical conductors and electrical devices.

16. The assembly of claim 11 wherein the main circuit portion and the plurality of circuit runner portions are in contact with the heat sink affixed to the air-intake manifold.

17. The assembly of claim 11 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices are mounted on the main circuit portion and the plurality of electrical conductors are affixed to the main circuit portion and the plurality of circuit runner portions.

18. The assembly of claim 11 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices and the plurality of electrical conductors are mounted throughout the main circuit portion and the plurality of circuit runner portions.

19. An integrated air-intake and circuit assembly for routing electrical signals in an internal combustion engine, the assembly comprising:

- an air-intake manifold for drawing fresh air into the internal combustion engine;

- a throttle body affixed to the air-intake manifold and in fluid communication therewith for regulating air induction into the internal combustion engine;

- a main circuit portion fixable to the throttle;

- a plurality of circuit runner portions extending from the main circuit portion for interconnecting the main circuit portion with a plurality of engine components; and

a heat sink affixed to the throttle body and in contact with at least one of the a main circuit portion and the plurality of circuit runner portions for dissipating heat generated in the circuit portions.

20. The assembly of claim 19 wherein the air-intake manifold is substantially comprised of plastic.

21. The assembly of claim 19 wherein the throttle body is substantially comprised of plastic.

22. The assembly of claim 19 wherein the heat sink is comprised of a thermally conductive material.

23. The assembly of claim 19 wherein the main circuit portion further comprises a flexible substrate for supporting electrical conductors and electrical devices.

24. The assembly of claim 19 wherein the main circuit portion further comprises a flexible substrate and a rigid substrate for supporting electrical conductors and electrical devices.

25. The assembly of claim 19 wherein the main circuit portion is in contact with the heat sink.

26. The assembly of claim 19 wherein the main circuit portion and the plurality of circuit runner portions are in contact with the heat sink.

27. The assembly of claim 19 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices are mounted on the main circuit portion and the plurality of electrical conductors are affixed to the main circuit portion and the plurality of circuit runner portions.

28. The assembly of claim 19 further comprising a plurality of electrical conductors and a plurality of electrical devices wherein the plurality of electrical devices and the plurality of electrical conductors are mounted throughout the main circuit portion and the plurality of circuit runner portions.